

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

FIFTH SEMESTER – NOVEMBER 2022

17/18UPB5ES03 – BIOINFORMATICS AND BIostatISTICS

Date: 30-11-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART – A

Answer the following, each in about 50 words

(10 x 2 = 20 Marks)

1. Write notes on World Wide Web (www).
2. Expand NCBI and EMBL.
3. What is sequence annotation?
4. Write notes on FASTA.
5. What are proteins?
6. Define ORF.
7. What is biostatistics?
8. Find the range of the following data: 45, 62, 36, 18, 96, 38, 52, 77, 88
9. Differentiate correlation and regression.
10. What is Null Hypothesis?

PART – B

Answer the following, each in about 500 words. Draw diagrams/ flowcharts wherever necessary.

(5 x 7 = 35 Marks)

11. (a) Give a brief account on the basics of the internet.
Or
(b) Write briefly on the amino acid substitution matrices.
12. (a) Discuss briefly on the multiple sequence alignment tool CLUSTAL.
Or
(b) Write short notes on dynamic programming.
13. (a) Draw and describe the structure of a gene.
Or
(b) Write notes on RasMol as a protein visualization tool.
14. (a) Discuss briefly on the diagrammatic representation of data.
Or
(b) Calculate the standard deviation, variance and coefficient of variation for the following data.

<i>x</i>	2	4	6	9	11	6	5	3
<i>f</i>	21	24	27	31	35	20	17	11

15. (a) In a flower breeding experiment, 107 magenta flowers with green stigma, 42 magenta flowers with red stigma, 38 red flowers with a green stigma and 13 red flowers with a red stigma were obtained. Mendel's law predicts the ratio to be 9:3:3:1 and the tabulated χ^2 value at 5% is 7.81 for 3 d.f. Draw your conclusions based on the calculated χ^2 value.

Or

- (b) Give a short account on the steps involved in ANOVA.

PART – C

Answer **any three** of the following, each in about 1200 words. Draw diagrams/ flowcharts wherever necessary. (3 x 15 = 45 Marks)

16. Give an account on the types of biological databases.
17. Discuss in detail on the principle of multiple sequence alignment and the construction of phylogenetic tree using UPGMA.
18. Give an account on methodology of genome annotation.
19. Calculate the correlation coefficient and the significance test for the following data: (Table t value at 5% = 2.31; 1% = 3.36 at 8 d.f.)

No. of fertile branches	8	10	15	11	12	9	13	14	10	9
No. of pods	45	55	70	80	65	70	90	90	76	67

20. Write in detail on the different methods of sampling.
